Franklin Fueling Systems

Overpressure Leak Detector

Installation and User Manual

Model LD-UPP-2

Franklin Fueling Systems • 3760 Marsh Rd. • Madison, WI 53718 USA

Tel: +1 608 838 8786 • 800 225 9787 • Fax: +1 608 838 6433 • www.franklinfueling.com

Contents

Product Description ... 3
Operative Range ... 3
Requirements for the Interstitial Spaces ... 3
Pipes ... 3
Fittings ... 3
Liquid to be conveyed and leak detection medium ... 3
Functional Description ... 3
Normal Operation ... 3
Function in case of a leak ... 3
Description of indicator Lights ... 4
Overpressure valve ... 4
Operating functions through keys ... 4

Installation Instructions ... 5
General Notes ... 5
Personal Protective Equipment ... 5
Installation of the Leak Detector ... 5
Guidelines for Installation of connections (leak detector - interstitial space) ... 5
Selection of the pressure reducer ... 5
Gas cylinder and pressure reducer (function test and initial operation) ... 5
Gas cylinder tank volume for operating method “S” ... 6
Power Specifications ... 6

Initial Operation / Repair ... 6
General Notes ... 6
Changing the operating method or the pressure level ... 7

Operating Instructions ... 7
General Notes ... 7
Maintenance ... 8
Functional Testing ... 8
Test Scope ... 8
Checking the Free Passage of Air in the Interstitial Space ... 8
Testing the switch values ... 8
Testing the Tightness After Initial Operation and Repair ... 9
Testing the Tightness as Part of the Annual Function Test ... 9
Creating the Operating Conditions ... 9
Alarm I Malfunction ... 9

Removal ... 9

Marking ... 9

Diagrams ... 10
M1-073 000 **Installation example operating method “S”** ... 11
M2-073 000 **Installation example operating method “S”** ... 12
M3-073 000 **Installation example operating method “M”** ... 13
M4-073 000 **Installation example operating method “M”** ... 14
SL-853 300 **Wiring Diagram** ... 15

Appendix A, Secondary Contained pipes / Fittings and Leak Detection Medium ... 16

Appendix B Switch and Pressure Values ... 17

Appendix TD Technical Data ... 18

Appendix DP Evaluation of the display from the function “Tightness Test” ... 19

DECLARATION OF CONFORMITY ... 20

Work Sheet AB-820 500 ... 21
Pneumatic connections ... 21

Unit Mounting Dimensions ... 23

Product Description

The LD-UPP-2 is an Over-Pressure leak detector for secondary contained pipe-work using pressurized air or inert gas as the leak detection medium.

The leak detector can be operated with a permanently connected gas cylinder (operating method "**S"** [static]) as well as a portable, priming gas cylinder (operating method "**M"** [mobile]).

Operative Range

Requirements for the Interstitial Spaces

- Proof of pressure resistance of the interstitial space (see Appendix B, Column: "Test" minimum test pressure of the interstitial space)
- Proof of suitability of the interstitial space (for Germany: Proof of suitability from construction authority).
- Tightness of the interstitial space (see section 6.4.4)
- The number of interstitial spaces to be monitored depends on the total interstitial space volume. According to EN 13160, 10 m3 (353 Cubic feet) may not be exceeded. For reasons of control of the tightness of interstitial spaces it is recommended not to exceed 4 m³ (141 cubic feet).

For pipes: The pipe length (per pipe duct) to be monitored may not exceed 2500 m (2734 yards) and must correspond with the specifications for the approval of the pipe.

Pipes

- Secondary contained pipes made of metal or plastic, in factory or on-site construction.
- Operating method "S" for surface and underground installed secondary contained pipes.
- Operating method "M" only for applications with temperature variations of less than ±10°C (for example: secondary contained pipes installed underground or indoors - no hot media).

Fittings

- Secondary contained fittings made of metal or plastic in factory or on-site construction.
- Operating method "S" for surface and underground installed secondary contained fittings.
- Operating method "M" only for applications with temperature variations of less than ±10°C (for example: secondary contained fittings used underground or indoors - no hot media).

Liquid to be conveyed and leak detection medium

Liquids which are hazardous to the environment, including those with flash points below 55°C. Limitations result in accordance with Appendix A from liquid to be conveyed and the leak detection medium that is used.

The conveyed product may not react with the leak detection medium.

The pipe / fitting shall be resistant against the conveyed product. Proof of this will be required by third parties (standards, operators, manufacturer of pipe / fitting).

Functional Description

The Over-Pressure leak detector LD-UPP-2 monitors both walls of the secondary contained system for leaks. The monitoring pressure during operation is higher than any pressure on the inner or outer wall, so that leaks will be indicated through falling pressure.

Inert gas, or air from a pressure tank, or an operational network can be used as leak detection media. If air is used, it must be dried to less than 10% relative humidity.

The current pressure is shown on the display in mbar/ bar or PSI (*Changing the bar and PSI settings is performed at the factory. This can also be changed on-site following coordination with the manufacturer).

- Values of less than 150 mbar or less than 2.18 PSI will not be displayed.
- Values between 100 and 990 mbar will be displayed in mbar and without decimal.
- Values from 1 bar are displayed in bar, with two, or from 10 bar with one decimal.
- Values in PSI are displayed with one or two decimals.

Switch and pressure values

A list of switch values is shown in Appendix B.

Normal Operation

The normal operation condition is achieved during initial operation by building up pressure to the specified pressure through the gas cylinder connected to the leak detector using operating method "S", or the priming gas cylinder if using operating method "M".

The existing pressure in the interstitial space is monitored with a pressure sensor in the leak detector. Any minor leaks lead to decreased pressure, which will be equalized during operating method "S".

For operating method "M", the requirements for the tightness of the interstitial space(s) and the connection(s) must be set very high to assure trouble free operation for one year.

Function in case of a leak

If there is a leak in the inner or outer wall, gas will leak from the interstitial space. The pressure falls.

When the switch value "Backfeed ON" is reached in operating method "S", the backfeed will be activated and the specified pressure will be built up again. If the leakage rate is greater than the limited backfeed rate, the pressure will continue to fall to alarm pressure.

An optical and audible alarm will be triggered when the alarm pressure is reached, which will open the dry relay contacts.

An additional relay can be used for operating method "M" to establish dry relay contacts when the specified pressure backfeed required is not reached.

Overpressure valve

If the interstitial space has sufficient pressure resistance (refer to Appendix B), an overpressure valve will not be supplied.

If overpressure valves are used, the test pressure of the interstitial space represents the layout basis for the set pressure for the overpressure valve. This means that overpressure valves from higher pressure levels can be used for a certain pressure level (alarm pressure) as well (refer to Appendix B).

The overpressure valve 1 (interstitial space) must be used if a pressure increase exceeding the test pressure (for example: warming) can occur and/or the set pressure on the pressure reducer is higher than the test pressure of the interstitial space.

The overpressure valve 2 (supply) must be used if the set pressure of the overpressure valve integrated in the pressure reducer is higher than the test pressure of the interstitial space.

Operating functions through keys
Turning Off the Audible Alarm:
Press “Audible Alarm” key once, audible signal turns off, the red LED blinks. Pressing the key again will turn the audible signal on.

This function is not available during normal operation and function errors.

Filling the Interstitial Space With Leak Detector Medium
Press “Fill” key and hold down for about 5 seconds until the yellow LED is blinking. The filling process has been activated. When the specified pressure has been reached, the yellow signal light will go out and the filling process is turned off. If the pressure falls due to pressure equalizing processes, the filling process can be reactivated to fill the interstitial space completely.

Holding this key down for more than 10 seconds will trigger the alarm. The triggered alarm will go off shortly after letting go of the key.

Testing the Optical and Audible Alarm
Press the “audible alarm” key and hold down (about 10 seconds). The alarm will be triggered until the key is released.

This inquiry is only possible if the pressure in the system has exceeded the “Alarm OFF” pressure.

Inquiry for Tightness of the Monitored System
Press the “audible alarm” key and hold down, until the red LED is flashing quickly. Release the key and press again. The display shows a value for the tightness. Refer to **Testing the Tightness as Part of the Annual Function Test, page 9**.

10 seconds after displaying this value the leak detector will return to normal operation.

This inquiry can only be performed in operating method “S”. The leak detector must have performed at least one automatic backfeed interval in normal operation (i.e. without manual activation of the filling function) to achieve a valid statement.

Description of indicator Lights

Signal Lights	Operating Condition	Backfeed active or required	Filling activated	Alarm Condition	Alarm, audible alarm verified	Device malfunction
OPERATION: Green	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**
ALARM: Red	**OFF**	**OFF**	**OFF BLINKING ON***	**ON**	**BLINKING**	**ON**
BACKFEED: Yellow	**OFF**	**ON**	**BLINKING**	**ON**	**ON**	**OFF**

*** Depending upon pressure and / or audible signal on or off**

Installation Instructions

General Notes

- Only qualified service companies must be used for installation.
- Comply with relevant regulations for prevention of accidents.
- Comply with Explosion Protection Regulations (when necessary).
- Compliance with the relevant traffic regulations is required when transporting gas cylinders to and from the construction site.
- The gas cylinder must be protected from falling over at the construction site.
- Provide sufficient ventilation if the operation is performed in enclosed spaces. Attach information sign.
- Provide a test valve on the end facing away from the leak detector at the end of the pipe(s) or fitting(s).
- Before entering inspection chambers, test the oxygen content and flush the inspection chamber if necessary.

Personal Protective Equipment

The parts listed here refer in particular to safety when working with systems that may be subject to risk of explosion. If work is performed in areas in which an explosive atmosphere may be expected, the minimum required equipment is as follows:

- Suitable clothing (risk of electrostatic charge).
- Suitable tools (in accordance with EN 1127).
- Suitable gas warning equipment calibrated to the existing vapor-air mixture. Work should be performed only at a concentration of 50% below the lower flammable limit (follow local codes if applicable).
- Measuring equipment to determine the oxygen content (Ex / O-Meter).

Installation of the Leak Detector

The Leak Detector is normally mounted on walls with plugs and screws. This can be in a dry room, or outdoors in a suitable protection box.

If installed in a protection box, additional outdoor signal or alarm forwarding via dry relay contacts to a switchboard or similar device can be added.

DO NOT install the Leak Detector in an area classified as hazardous (danger of explosions).

Lead through, into, and out of the dome shaft (or inspection chambers) for connections shall be closed gas-tight.

Guidelines for Installation of connections (leak detector - interstitial space)

- Use metal (generally Copper) or plastic pipes with a minimum pressure resistance corresponding with the test pressure in the interstitial space. Also applies to fittings and screwed connections. (Note temperature range, especially with use of plastic).
- Inside clearance at least 4 mm for inert gas as leak detection medium at least 6 mm for air as leak detection medium.
- 50 m should not be exceeded significantly. If 50 m is exceeded install pipe with greater inside clearance using transition pieces.
- The full cross section must be maintained. Do not crush or bend. (If necessary, install commercial plastic pipe fittings with specified bend radii).
- Metal or plastic tubes that are installed underground or above ground should be installed inside a conduit.
- Close the protective pipe gas-tight and protect it from moisture.
- Avoid the buildup of electrostatic charges (eg. During the pulling of lines).
- Grounding in accordance with valid regulations.
- For details regarding connection systems, see worksheet AB-820 500.

Selection of the pressure reducer

- The pressure reducer must have an integrated overpressure valve.
- The range of settings for the pressure reducer to be used must be selected in correspondence with the application or the pressure to be set (see appendix B)

Gas cylinder and pressure reducer (function test and initial operation)

1. Remove the protective cover after the gas cylinder has been set up securely.
2. Install the pressure reducer on the cylinder.
3. Close the shut-off valve on the pressure reducer.
4. Install the connection between the leak detector and the pressure reducer.
5. Turn the pressure control valve all the way back.
6. Open the cylinder shut-off valve. (if necessary, check seal between pressure reducer and cylinder)
7. Set the pressure on the pressure reducer according to Appendix B with the pressure control valve on the pressure reducer (adjust after pressure build-up, if necessary).
8. After completion of the function test with operating method “M” or to change the cylinder:
   - Close the shut-off valve on the pressure reducer.
   - Close the cylinder shut-off valve.
   - Remove the pressure reducer from the cylinder (Attention: Gas will escape until the pressure reducer has no pressure).
   - Install protective cover on cylinder.

9. For cylinder change, continue with:
   - Secure setup, then remove protective cover.
   - Install pressure reducer.(if necessary, Check seal between pressure reducer and cylinder)
   - Open cylinder shut-off valve.
   - Open shut-off valve on the pressure reducer, and, if necessary, adjust pressure with pressure control valve.

Gas Cylinder tank volume for operating method “S”

1. A gas cylinder containing 10 to 50 litres can be used up to a interstitial space volume 5m³
2. For more than 5 m³, a gas cylinder containing 50 litres must be used.

Power Specifications

1. Power supply: According to label.
2. Fixed wiring, i.e.. no plug or switch connections.
3. Regulations of power supply companies must be adhered to.

Terminal layout: (see also SL-853 300)

Terminals	Connection
1 / 2	Power supply
3 / 4	Reserved (with internal magnetic valve)
5 / 6	External signal (in the event of an alarm there will be a line voltage present; is turned off by activating the “audible alarm” key).
11/12	Dry relay contacts (opened in case of alarm or loss of power)
17 / 18	For operating method “M” when the pressure “backfeed is required” is not reached, these connections have 12 V. Suitable for connection of a relay (12 V) to activate an alarm.
21 / 22	Reserved (with internal sensor)

Power Connections

Initial Operation / Repair

General Notes

1. Observe all guidelines listed earlier.
2. Flush the interstitial space with inert gas when walls of storage medium are not considered impermeable.
3. If a leak detector is operated on a pipeline that is already in operation, special protective measures must be taken (for example, testing of free gases in the leak detector and / or the interstitial space). Additional measures may be necessary depending on the local conditions and must be assessed by qualified personnel.
4. After completion of the pneumatic connection, connect power.
5. Ascertain lighting of “Operation” and ‘Alarm’ signal lights and the audible alarm. Turn off the audible alarm, if necessary.

With operating method “S”, the power supply activates the automatic backfeed.

6. Pressure build-up / filling the interstitial space:
   - Press the “Fill” key and hold down for about 5 seconds until the yellow signal light is blinking. The magnetic valve will open to quickly fill the interstitial space. When the specified pressure has been reached, the filling process is turned off and the yellow signal light will go out.
   - With very large interstitial spaces it may be necessary to switch gas cylinders.
   - Note: If no pressure buildup is achieved with the gas cylinder connected, the leak must be located and corrected (check the settings for the pressure reducer as well, if necessary).

Note: Display on the leak detector begins with 150 mbar pressure.

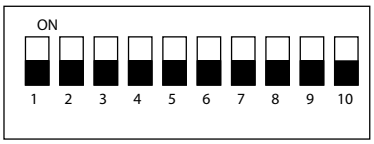
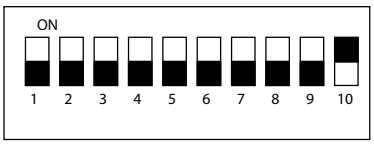
7. It may be necessary to press the “Fill” key repeatedly to achieve complete filling of the interstitial space.
8. Check all connections for leaks with a foaming agent.
9. Function test per the Functional Testing section.

Changing the operating method or the pressure level

1. Switch settings 1-9 are designed to select the level of pressure. Switch setting 10 is designed to select the operating method.

DIP Switch

2. The operating method ‘M” or “S’ can be set or changed at the construction site by changing the position of switch number 10 on the switchboard.

Switch position 10, regardless of the level of pressure	
Operating method “S”	
Operating method “M”	

3. Switch settings for pressure levels (switches 1-9) are shown in Appendix B.
4. If the switch settings 1-9 are changed at the construction site, it must be assured that the set pressure level does not exceed the set pressure for the overpressure valve.

Operating Instructions

General Notes

- If the leak detection system has been properly installed and is free of leaks, trouble-free operation can be assumed.
- Leak detector (electric) cannot be turned off.
- With operating method “M”, even very small leaks will trigger the alarm.
- In the event of an alarm, determine the cause and correct it immediately.
- The leak detector must be disconnected from power for any repairs to be performed on the leak detector.
- A loss of power is indicated by the “Operating” signal light going off. A loss of power to the relay contacts (if used for alarm transmission) triggers the alarm.

  After the power loss, the green signal light lights up again and the dry relay contacts no longer generate an alarm (unless the power loss has caused the pressure to drop below the alarm pressure).

- Use operating method “M”: For secondary contained pipes / fittings installed underground or indoors per the Operative range section.
- Use operating method “S”: For secondary contained pipes/fittings installed above or underground.
- Feed pressure must be at least 1 bar lower than the minimum alarm pressure.

Use of medium pressure air as the leak detection medium:

- Air pressure can always be used with transport media having a flash point above 55°C.
- For transport media with a flash point below 55°C only if their explosive vapor-air mixtures can be assigned to temperature code T1 to T3 and gas group 1IA or II B and if they have an inner wall that is not permeable for media that can lead to the development of explosive vapor-air mixtures.

Use of nitrogen as the leak detection medium:

- Follow guidelines in Appendix A.

Maintenance

- Maintenance work and function tests must be performed by qualified personnel only.
- Once a year to ensure functional and operational safety.
- Follow guidelines in the Test Scope section.
- Compliance with the conditions per Installation and Initial Operation / Repair sections must also be tested.
- Perform tightness testing per the Testing the Tightness After Initial Operation and Repair section.

Functional Testing

The functional and operational safety tests must be performed:

- After each initial operation
- Once a year
- After each repair

Test Scope

1. Coordinate the work to be performed with those responsible for operation on-site, if necessary.
2. Observe the safety instructions for working with the liquid to be conveyed.
3. Check the test valve at the end of the interstitial space pointing away from the leak detector for contamination and clean, if necessary.
4. Check the free passage of air (or nitrogen) in the interstitial space (see below).
5. Check the switch values (see below)
6. Check tightness following initial operation or repair (see below)
7. Check tightness as part of the annual function test (see below)
8. Creating the Operating Conditions (see below)
9. A qualified person must complete a test report, confirming functional and operational safety.

Checking the Free Passage of Air in the Interstitial Space

If several interstitial spaces are connected in parallel, each one must be checked for passage.

1. Insert a measuring instrument into the test coupling. The current pressure in the interstitial space will be displayed.
2. Open the test valve for the first connected interstitial space.
3. Check that the measuring instrument registers a pressure drop.
4. Close the test valve.
5. Repeat procedure from steps (2) to (4) for each additional test valve for the interstitial space(s) connected to this leak detector.

Note: With operating method “S”, if automatic back-feed is activated during this process, perform the filling process and then continue the test.

6. With operating method “M”, the pressure that has fallen due to the test must be equalized as follows:
   a. Connect the pressure tank per the Gas Cylinder and Pressure Reducer (function test and initial operation) section on page 5
   b. Activate ‘Fill”.
   c. Build up pressure to specified pressure. Check the pressure on the pressure reducer during the filling procedure (test pressure may not be exceeded) and adjust, if necessary.
   d. Once the filling process has been completed, close the shut-off valve on the pressure reducer and disconnect the test measuring instrument and the air cylinder.

Testing the switch values

1. If several interstitial spaces are connected through one distribution system, close all shutoff cocks on the distributor except for the shut-off cock for the interstitial space with which the test is performed.
2. Insert a manometer into the test coupling.
3. Open the test valve at the end of the interstitial space included in the test pointing away from the leak detector.
4. Check the switch values for “Automatic Backfeed” or “Backfeed required” (the yellow signal light is lit up) and for Alarm ON. Record the values.
5. Close the test valve.
6. **Operating method “S”**: During the pressure buildup (automatic filling), check the switch values for ‘Alarm OFF’ and ‘Backfeed OFF’ (activate ‘Fill’ if necessary). Record the values.

   Operating method “M”: Connect the gas cylinder per the Gas Cylinder and Pressure Reducer (function test and initial operation) section on page 5.
   a. Activate Fill.
   b. During the pressure buildup, check the switch values for “Alarm OFF” and “Backfeed (here: Filling) OFF”.
   c. Record the values.
   d. Remove the gas cylinder.
7. The test is considered passed if the specifications per Appendix B have been met.
8. Disconnect the measuring instrument.
9. Open all shut-off cocks in the connection(s).

Testing the Tightness After Initial Operation and Repair

1. Insert the test measuring instrument into the test coupling.
2. The test measuring instrument will display the current pressure.
3. The tightness check is approved for one year of trouble-free operation if the following conditions have been met:

Operating method “S”:

The test time per 100 litre interstitial space volume is 8 minutes. 1 mbar pressure loss is permitted within this specified test time. If a pressure loss of 1 mbar cannot be measured, this will result in the multiplication of the pressure loss according to the same multiplication of the test time.

Example:

Interstitial space volume: 1500 litres;

Test time (with 1 mbar measurable pressure loss): 1500 / 100 x 8 = 120 minutes Test time (with 10 mbar measurable pressure loss): 120 x 10 = 1200 minutes (20 hours)

Operating method “M”:

Determine the difference between the measured values for “Backfeed (Fill) OFF” and

“Alarm ON” and convert into mbar (x 1000). Divide the calculated value by 8760. This results in a maximum tolerated pressure loss (per hour) to prevent triggering of an alarm before one year has passed.

If the determined value cannot be measured, this will result in the multiplication of the pressure loss according to the same multiplication of the test time.

Example:

Difference between the above named switch values: 1.75 bar (value measured onsite)

1.75x 1000=1750

1750 / 8760 = 0.2 mbar / h (approved pressure loss)

The measuring instrument onsite shows only one value of 5 mbar. This means the readability is 25 times (5/ 0.2). This extends the test time to 25 hours.

4. Disconnect the test measuring instrument after the tightness test has been completed.

Testing the Tightness as Part of the Annual Function Test

1. Perform an Inquiry of Tightness Procedure (See page 4).
2. Evaluate the displayed value (visible on the display for 10 seconds) per Appendix DP. This appendix serves informational purposes only and is not part of the permit.

Creating the Operating Conditions

1. Seal the housing and the test valve(s) at the end of the interstitial space pointing away from the leak detector with lead.
2. If shut-off cocks have been installed in the connections, they must be sealed (if connected to an interstitial space) with lead in an opened position.
3. Make sure that for operating method “S”, the gas cylinder is filled sufficiently.

Alarm I Malfunction

1. Red and yellow signal lights light up, the audible signal sounds.
2. Turn the audible signal off.
3. Inform the installation company immediately.
4. Determine the cause for the alarm, correct it, and then perform a function test for the leak detection system per the Functional Testing section on page 8.
5. In the event of a malfunction, only the red signal light will be lit up (yellow is off). Notify the manufacturer.

Removal

For the removal of units, which can cause an explosion risk, the following points must be observed in particular:

- Follow applicable rules for electrical disconnection.
- Make sure the unit is free of gas before and during removal work.
- Seal any openings gas-tight through which the explosion atmosphere can carry over.
- Do not use spark-producing electrical tools (saws, parting grinders, etc.) for removal. If this is unavoidable, be certain to observe EN 1127.
- Use low-spark tools.
- Avoid the buildup of electrostatic charges (e.g., through friction).
- Properly dispose of contaminated components (possibly through outgassing).

Marking

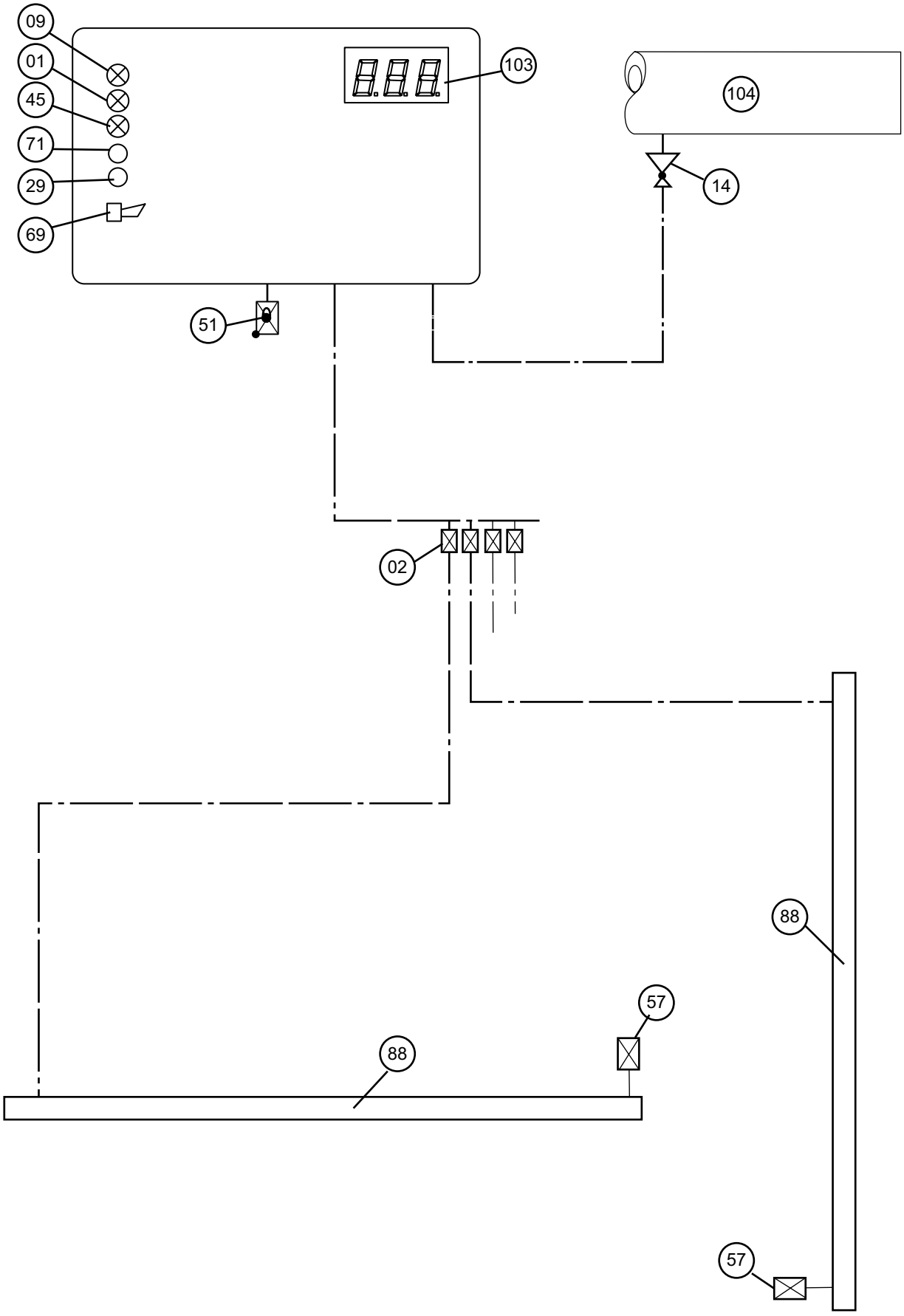
- Electrical data
- Serial number
- Type ID
- Date of manufacture (month/year)
- Manufacturer ID
- Statutorily specified symbols
- The connection(s) can be connected to areas that require devices of category 3 (group II (G)) (Ti to T3; hA to IIB).pp

Diagrams

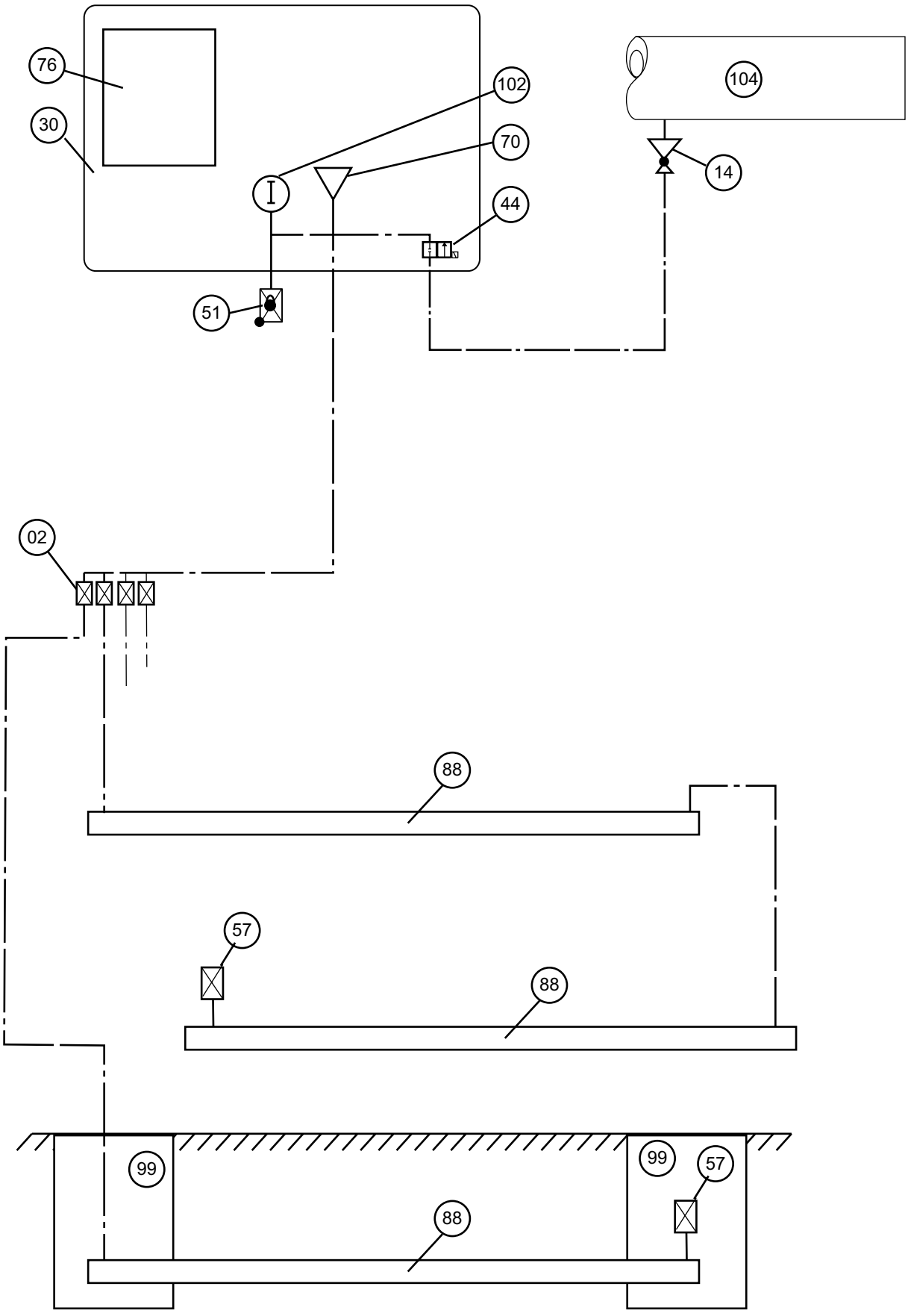
Key for diagrams

01	“Alarm” signal light, red
02	Shut-off valve
06	Connecting coupling “Fill”
05	Shut-off valve (on the pressure reducer)
09	“Operating” signal light, green
14	Pressure reducer
19	Gas cylinder
24.1	Fine-wire fuse “Exterior Signal” T1A
24.2	Fine-wire fuse ‘Transformer” T32mA
24.3	Fine-wire fuse “Magnetic valve” T8OmA
25	Bottle stop valve
29	Key “Fill”
30	Housing
44	Magnetic valve
45	Signal light “Backfeed”
51	Test coupling
57	Test valve
59	Relay
14	Pressure Leak Detector
69	Buzzer
70	Overpressure valve
71	“Audible alarm” key
76	Main circuit board
77	Pressure control valve
88	Secondary contained pipe / secondary contained fittings or combination of both
99	Inspection chamber
102	Pressure sensor
103	Display
104	Operational network (e.g. air / nitrogen)
105	Control unit
106	Contacts for serial data transmission

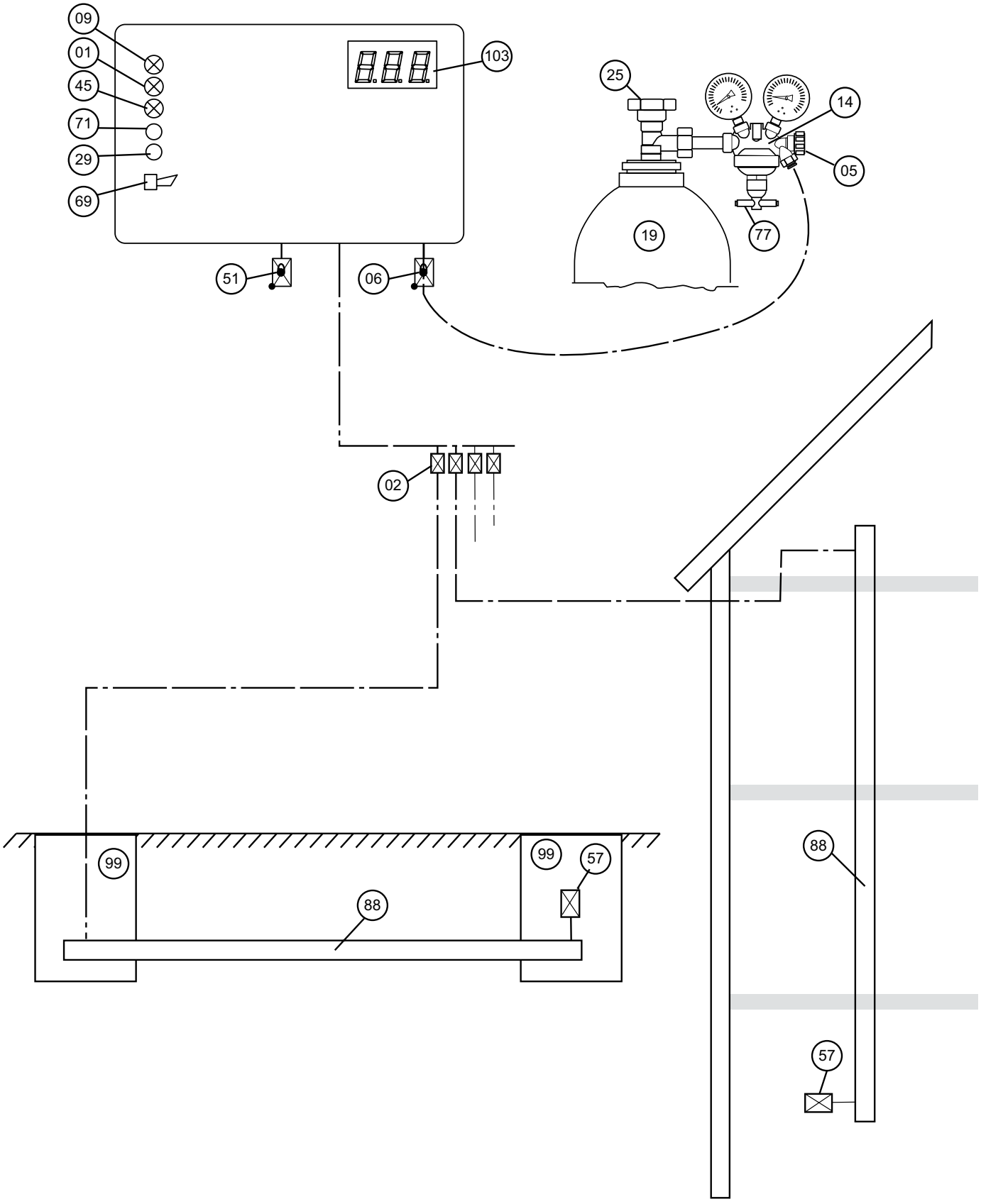
M1-073 000
Installation example operating method “S”



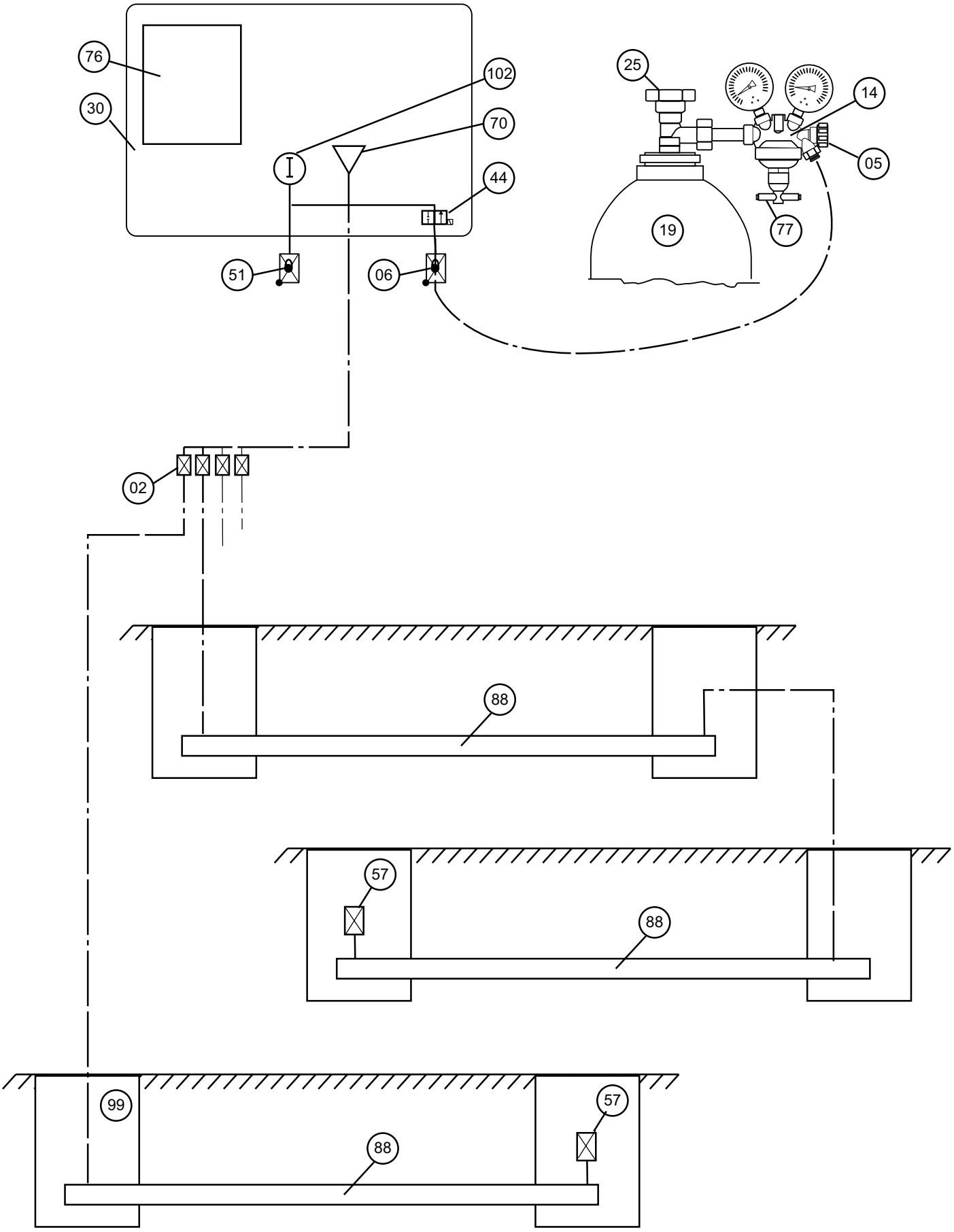
M2-073 000
Installation example operating method “S”



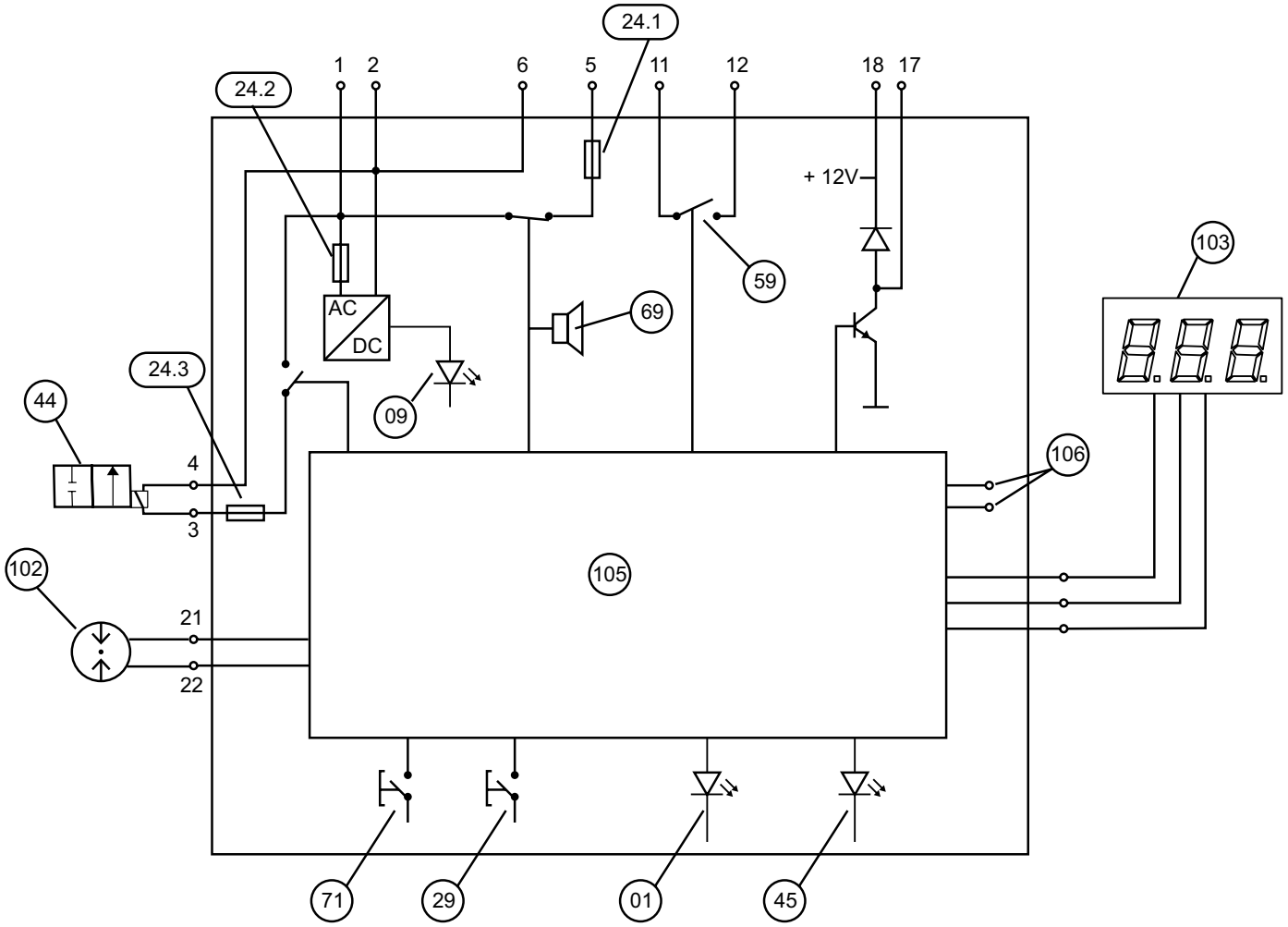
M3-073 000
Installation example operating method “M”



M4-073 000
Installation example operating method “M”



SL-853 300
Wiring Diagram



Appendix A

Secondary Contained Pipes / Fittings and Leak Detection Medium

For conveying products with a flash point of >55°C, air or inert gas can be used as long as the leak detection medium is compatible with the product.

The following statements apply only to applications to transport liquids with flash points of less than 55°C.

The following statements are based on a risk evaluation according to the directive 94/9/EEC (explosion directive). The risk evaluation was performed based on the table in Appendix B (informative) for EN 13160.

If the evaluation of the device categories has different results due to operational regulations or for any other reasons, the use of the leak detector must be checked separately.

Walls of storage medium	Overpressure valve for interstitial space	Operating method	Suggested leak detection medium or use of the leak detector prohibited
Permeable: (e.g. unlined plastic pipe)	Exists	S	Inert gas
		M	Use prohibited
	Does not exist	S	Inert gas
		M	Use prohibited [1]
Not permeable: (e.g. UPP pipe approved to EN14125)	Exists	S	Inert gas/air pressure [2]
		M	Inert gas
	Does not exist	S	Inert gas/air pressure [2]
		M	Inert gas

[1] The leak detector with inert gas can only be used for this application if the operator assesses the interstitial space to be a zone 2.

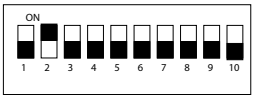
[2] The use of air pressure does not present any problems with interstitial spaces for pipes/fittings with a medium transporting area, that is not permanently filled with products (e.g. filling lines). When air pressure is used for interstitial spaces of pipes/fittings with a medium transporting area that is permanently filled with product, it must be assured that the product conveying equipment (e.g. pumps) is suitable for zone 0, because in the event of a leak, air will be pressed into the product transporting system.

If the pressure supply is from a pressure gas bottle, the pressure gas bottle must be equipped with residual pressure monitoring. In case of a notification (fall below the set residual pressure) the pressure gas bottle is to be refilled or replaced with a full one.

Appendix B

Switch and Pressure Values

If possible, leak detectors that are operated with operating method “M” should be operated without overpressure valves.

Type LD-UPP-2	Application	P_B [bar]	P_{AE} [bar]	P_{PA} [bar]	Position of DIP switch	$P_{ÜDV1}$ [1] [bar]	$P_{ÜDV2}$ [2] [bar]	$P_{PRÜF}$ [bar]	P_{DM} [bar]
1	Monitor double wall filling lines and double wall suction lines	Unpres-surized	> 1	< 2		2.8 ± 0.15	6.5 ± 0.2	> 3.4	2.5
2	Monitor double wall pressure lines	< 1	> 2	< 3		3.8 ± 0.2	7.5 ± 0.2	> 4.5	3.5

The following abbreviations are used in the table:

P_B Maximum operating pressure in the inner pipe (transportation pressure + dynamic pressure + pressure due to geodetic height differences)

P_{AE} Switch value “Alarm ON”; the alarm will be triggered at this pressure level

P_{AA} Switch value “Alarm OFF”; alarm will be deactivated if this value is exceeded (P_{AA} = P_{AE} + ~250 mbar)

P_{PA} Switch value “Backfeed OFF” (=specified pressure) PPE Switch value “Backfeed ON” (P_{PE} = P_{PA} - ~250 mbar)

$P_{ÜDV1}$ Specified pressure to activate overpressure valve 1 (interstitial space)

$P_{ÜDV2}$ Specified pressure to activate overpressure valve 2 (supply)

$P_{PRÜF}$ Minimum test pressure of interstitial space

[1] The overpressure valve ÜDV1 can be omitted, if it can be assured that the pressure in the interstitial space will not exceed the test pressure (e.g. through warming) and that the set pressure on the pressure reducer is lower than the test pressure of the interstitial space.

If pressure valves ÜDV1 from higher pressure levels are used, sufficient pressure resistance of the interstitial space shall be guaranteed.

[2] The overpressure valve ÜDV2 can be omitted if the test pressure of the interstitial space is higher than the specified pressure of the overpressure valve integrated in the pressure reducer.

Appendix TD
Technical Data

1. **Electrical data**

   Input capacity (without external signal): 230V, 50Hz, 20W

   Switching contact load, terminals AS: 23V, 50Hz, 1A

   Switch contact load, dry relay contacts: Max:230V, 50z, 2A

   Min: 10V, 10mA

   External fuse protection of the leak detector: .....Max. 10A

   Overvoltage category: 2

2. **Pneumatic Data (Requirements for the Test Measuring Instrument)**

   Nominal size: .....at least 100

   Class precision: .....at least 1,6

   End scale value: .....suitable depending on pressure level

Appendix DP
Evaluation of the display from the function “Tightness Test”

The tightness test as part of the annual function test is described on page 9. As long as the value shown on the display does NOT exceed the following nominal values, it can be assumed that the system is so tight that the gas cylinder being used (200 bar filling) will last for one year:

- 50 litre gas cylinder: Display from 0 to 7
- 10 litre gas cylinder: Display 0 or 1

The smaller the above value, the tighter the system. The expression of these values depends on a number of factors including the setting for the supply pressure on the pressure reducer. The above statement is therefore meant to be a guideline (nominal value) and cannot provide a final statement regarding the “actual” tightness of the system.

The following values mean:

• 50 litre gas cylinder:	Display from 8 to 10	Gas cylinder will probably need to be changed before the year has passed.
• 10 litre gas cylinder:	Display from 2 to 10	Gas cylinder will probably need to be changed before the year has passed
	Display from 15	Inquiry not possible (generally set to operating method “M”)

DECLARATION OF CONFORMITY

This declaration applies to the OVER-PRESSURE LEAK DETECTOR LD-UPP-2

With this declaration, Franklin Fueling Systems verifies the above mentioned leak detector complies with the protection requirements specified in EU directive 89/336/ EEC for adjustment of statutory regulations of the member states electromagnetic compatibility or German law for electromagnetic compatibility (EMVG) from November 9, 1992 (section 1).

This declaration applies to items produced according to the documentation (technical description, drawing(s)), that is part of this declaration.

The following regulations were applied to evaluate the product regarding electromagnetic compatibility:

EN 50081:1998 (Emission)

EN 61 000-3-2

EN 64 000-3-3

EN 61 000-6-2: 1999

(Resistance to jamming)

With this declaration, Franklin Fueling Systems verifies that the above mentioned leak detector corresponds with protection requirements specified in the EU directive 73/23/ EEC for the adjustment of the statutory regulations of the member states regarding electrical operating means for use within certain voltage limits or in the 1st regulation of the device safety laws from June 11, 1979.

This declaration applies to items that are produced according to The documentation (technical description, drawing(s)), that is part of this declaration.

The following regulations were applied to evaluate the product regarding its use within certain voltage limits.

- EN60335-1:1988
- EN61010-1:1993
- EN61010-A1:1992

With this declaration, Franklin Fueling Systems verifies that the above mentioned leak detector corresponds with protection requirements specified in the EC Directive 94/9 EEC for alignment of the legal regulations of the member states for equipment and protective systems for intended use in explosion hazard areas or in the 2d Code on the Equipment Protection Law dated 12 December 1996.

The leak detector may be connected with its pneumatic components to monitoring chambers of tanks requiring equipment regarding category 3. This declaration applies for appliances produced according to the documentation in accordance with internal GM documentation (technical description with drawings)

— which are constituents of this declaration.

Evaluation of the product was accomplished. The following documents were used for this purpose:

- EN 1127-1:1997
- EN 13463-1:2001
- EN 13160-1:2003

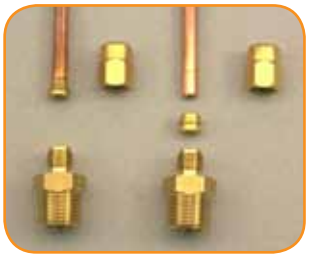
The ignition hazard of analysis / risk evaluation indicated no further hazards.

Work Sheet AB-820 500
Pneumatic connections

A. Flare type fitting for flare type pipes

1. Lubricate the O-rings
2. Place the intermediate ring loosely in the threaded connection piece
3. Push the union nut and the thrust collar over the pipe
4. Tighten the union nut manually
5. Tighten the union nut until clearly increased force is needed
6. Finished assembly: turn by a further ¼ of a revolution

B. Clamping ring threaded fitting for plastic and metal pipes



1. Insert the support sleeve into the end of the pipe.
2. Insert the pipe with support sleeve as far as it will go.
3. Tighten the thread until strong resistance can be clearly felt.
4. Lightly loosen the nut.
5. Tighten the nut until resistance can be felt (nut must exactly match the thread of the basic body).

C. Olive threaded fitting for plastic and metal pipes

1. Insert the reinforcing sleeve into the end of the pipe.
2. Knock in the reinforcing sleeve.
3. Push the union nut and the olive over the end of the pipe.
4. Screw the union nut by hand until you feel a stop.
5. Press the pipe against the stop in the inner cone.
6. Tighten the union nut by approx. 1.5 revolutions (pipe must not turn).
7. Loosen the union nut: check whether the pipe visibly projects from under the cutting ring (it doesn't matter if the clamping ring can be turned).
8. Retighten the union nut using normal force.

D. Quick-action fitting for PA- and PUR-tubes

1. Make a right-angled cut in the PA pipe.
2. Loosen the union nut and push it over the end of the pipe.
3. Push the pipe onto the nipple up to where the thread begins.
4. Tighten the union nut by hand.
5. Further tighten the union nut using a wrench until clearly increased force is needed (approx. 1 to 2 revolutions).
   NOT suitable for PE-pipes

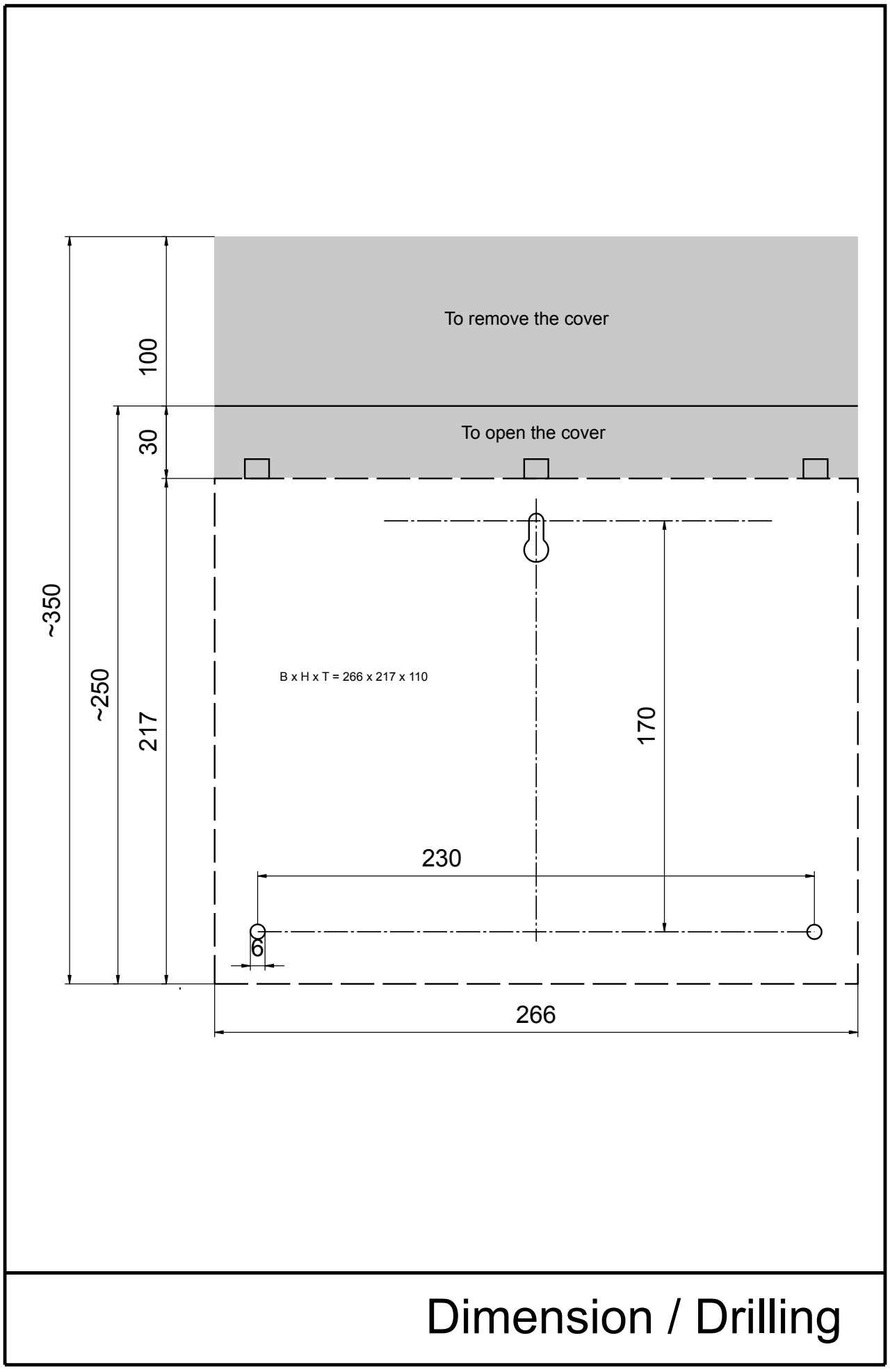
E. Tube connections (socket 4 and 6 mm for EXCESS PRESSURE)

1. Push wire or screw clip over the tube.
2. Push the tube onto the Cu pipe or the tube socket (if necessary heat or dampen PVC tube), tube must fit tightly all the way round.
3. Wire clip: clamp tightly using pliers and push onto the joint.
4. Screw clip: push the clip over the joint and tighten it using a screwdriver, care must be taken that the clip is a smooth tight fit.

F. Tube connections (socket 4 and 6 mm for VACUUM)

For vacuum applications where there is no excess pressure on the connection lines even in the case of a leakage proceed as in item 5, but without clips. For vacuum applications where excess pressure could arise in the case of a leakage, proceed as in Item E.

Unit Mounting Dimensions



Franklin Fueling Systems

www.franklinfueling.com

3760 Marsh Road • Madison, WI 53718, U.S.A.
Tel: +1 608 838 8786 • Fax: +1 608 838 6433
Tel: USA & Canada 1 800 225 9787 • Tel: México 001 800 738 7610

Franklin Fueling Systems GmbH
Rudolf-Diesel-Strasse 20 • 54516 Wittlich, GERMANY
Tel: +49-6571-105-380 • Fax: +49-6571-105-510

Franklin Fueling Systems LTD
8 Olympus Close • Whitehouse Industrial Estate
Ipswich, Suffolk IP1 5LN • United Kingdom
Tel: +44 1473 243300 • Fax: +44 1473 243301

©2011 FFS 408001012 rev 1